

### REMARKS

Applicant has reviewed and considered the Office Action dated November 7, 2003, and the references cited therewith.

Claims 1 and 8 are amended, no claims are canceled, and claims 27-33 are added; as a result, claims 1-33 are now pending in this application.

Claim 1 is amended for typographical reasons. In addition, claim 1 and claim 8 are amended to more clearly recite the disclosed subject matter.

New claim 27 is based on claim 5 (and independent claim 1) which was indicated to be objected to and allowable if rewritten in independent form. New claims 28 and 29 are based on claim 6 and claim 7 which also were objected to and indicated to be allowable if rewritten.

New claim 30 is based on claim 11 (and independent claim 8) which was indicated to be objected to and allowable if rewritten in independent form. New claims 31 and 32 are based on claim 12 and claim 13 which also were objected to and indicated to be allowable if rewritten.

New claim 33 is based on claim 20 (and independent claim 17) which was indicated to be objected to and allowable if rewritten in independent form.

It is believed that the amendments and the new claims presented herein do not add new matter and that support for the amendments and new claims is found in various portions of the specification.

### §102 Rejection of the Claims

Claims 1, 2, 8, 17 and 19 were rejected under 35 USC § 102(b) as being anticipated by Yamany et al. ("3D Construction of the Human Jaw from a Sequence of Images," hereinafter "Yamany I").

Applicant respectfully traverses the rejection and submits that *prima facie* anticipation has not been established because, it is believed, all recited elements of the claims are not found in the cited document. For example, and notwithstanding the amendment to the claims, Applicant is unable to find, in Yamany I, a disclosure of generating range data using a digitizing arm, as recited in claim 1 and in claim 8.

As to claim 17, Applicant respectfully submits that the cited document does not disclose a digitizer providing five degrees of freedom, having an arm and a charge coupled device

camera, rigidly mounted on the arm of the digitizer, as recited in the claim. The Office Action refers to cited portions of Yamany I, however, Applicant is unable to find that these portions disclose the subject matter recited in the claim.

As to dependent claims 2 and 19, Applicant respectfully submits that each recites additional elements beyond that of the independent claim from which each depends. For at least the reasons presented herein regarding the independent claims, it is believed that claims 2 and 19 are also in condition for allowance.

For these and other reasons, it is believed that *prima facie* anticipation has not been established. Reconsideration and allowance of claims 1, 2, 8, 17 and 19 is respectfully requested.

Claim 16 was rejected under 35 USC § 102(b) as being anticipated by Yamany et al. ("A System for Human Jaw Modeling Using Intra-Oral Images," hereinafter "Yamany II").

Applicant respectfully traverses the rejection and submits that *prima facie* anticipation has not been established because, it is believed, all recited elements of the claim are not found in the cited document. For example, Applicant is unable to find, in Yamany II, a disclosure of generating shape-from-shading data that is generated from a direction of an illuminant of the jaw that is estimated in reference to camera intrinsic parameters. Applicant believes that neither the cited portions or Yamany II, in general, provide support for the Office Action assertion.

For these and other reasons, it is believed that *prima facie* anticipation has not been established. Reconsideration and allowance of claim 16 is respectfully requested.

### §103 Rejection of the Claims

Claims 3, 9, and 18 were rejected under 35 USC § 103(a) as being unpatentable over Yamany I in view of Rider et al. (U.S. Patent No. 6,192,329, hereinafter "Rider").

Applicant respectfully traverses the rejection and submits that *prima facie* obviousness has not been established. In particular, it is believed that the asserted motivation in support of the proposed combination is improper and does not include the required cogent reasoning. In addition, Applicant respectfully submits that the proposed combination is improper because,

*inter alia*, Rider appears to teach away from combining with Yamany I. For example, Rider states:

... the shape of the oral cavity on CT scans or MR images is difficult to define. Therefore, to reconstruct the oral cavity in children 1, 2, 3, and 4 years old, castings of the mouths of patients in these age groups are made (step 110). (*Column 3, lines 43-53*)

Thus, it appears that Rider resorts to "castings of the mouths" whereas Yamany I refers to "intra-oral video cameras." In order to combine Yamany I and Rider in the manner proposed, it appears that substantial reconstruction or redesign would be required. An obviousness rejection is not appropriate if substantial reconstruction or redesign of the prior art references is necessary to arrive at the claimed subject matter.

In addition, and as to claim 18, Applicant is unable to find, in the proposed combination of Yamany I and Rider, a teaching or suggestion of a rapid prototyping machine, as recited in the claim. The Office Action does not include an explicit assertion that such a machine is taught or suggested by the proposed combination and Applicant is unable to find same.

For these and other reasons, it appears that *prima facie* obviousness has not been established. Reconsideration and allowance of claims 3, 9 and 18 is respectfully requested.

Claims 4 and 10 were rejected under 35 USC § 103(a) as being unpatentable over Yamany I in view of Yamany II.

Applicant respectfully traverses the rejection and submits that *prima facie* obviousness has not been established. In particular, it is believed that the asserted motivation in support of the proposed combination is improper and does not include the required cogent reasoning. In addition, it appears that the Office Action does not provide clear citations to the particular references used in the rejection. Applicant respectfully requests clarification or withdrawal of the rejection.

For these and other reasons, it appears that *prima facie* obviousness has not been established. Reconsideration and allowance of claims 4 and 10 is respectfully requested.

*Allowable Subject Matter*

Claims 5-7, 11-13 and 20 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant, however, submits that the enumerated claims are in condition for allowance without amendment for at least the reasons set forth herein. In addition, Applicant has presented new claims 27-33 directed to subject matter corresponding to that which the Office Action has indicated to be allowable.

Claims 14-15 and 21-26 were indicated to be allowable.



AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

Serial Number: 09/842587

Filing Date: April 26, 2001

Title: SYSTEM AND METHOD FOR 3-D DIGITAL RECONSTRUCTION OF AN ORAL CAVITY FROM A SEQUENCE OF 2-D IMAGES

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Dkt: 1160.012US1

Conclusion

Applicant respectfully submits that the pending claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6911 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743

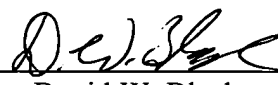
Respectfully submitted,

ALY A. FARAG ET AL.

By their Representatives,

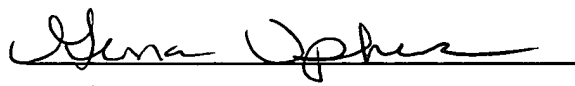
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Date February 6, 2004

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 6 day of February, 2004.

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